LAKE COUNTY ENGINEER
DESIGN STANDARDS

Supplement to

O.D.O.T. Location and Design Manual

Volume I – Roadway Design

February 2009

PREFACE

All Lake County-sponsored Highway/Bridge improvements shall be designed in accordance with Volume One of the Ohio Department of Transportation (ODOT) Location and Design (L&D) Manual, except as modified herein. The topic headings and section numbers used in this manual correspond to those in the L&D Manual In order to facilitate cross-referencing. References made to the State, Bureau/Engineer of Location and Design, or any other term designating any representative or employee of the State, or the Department of Transportation, as found in Volume I of the O.D.O.T. L&D Manual, shall mean Lake County.

For the purposes of applying design standards, Lake County Engineer projects shall be grouped into one of three (3) categories as follows:

1. Maintenance Resurfacing
2. Resurfacing, Restoration and Rehabilitation (3R) Projects
3. New Construction

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* O.D.O.T. Pavement Design and Rehabilitation Manual

I. Maintenance Resurfacing Projects

The purpose/scope of a maintenance-resurfacing project is to restore pavement structure and smoothness while retaining the existing line, grade, and geometrics of the facility.

For this type of project, the Lake County Traffic Engineer shall field-verify that any potential safety hazards are properly signed and that sufficient warning devices and protective barriers exist. The project should correct any deficient signing, pavement markings, warning devices and/or protective barriers. Signage deficiencies and corrections shall largely conform to the Ohio Manual of Traffic Control Device (OMUTCD). The traffic engineer will use accepted practice and good engineering judgment in those unique situations requiring a deviation from the manual.

II. Resurfacing, Restoration and Rehabilitation (3R) Projects

The purpose/scope of a 3R project is as stated in Section 900 of the ODOT L&D Manual, Volume 1. The design standards utilized for these types of projects shall be as stated in Section 900 of the L&D Manual with the following exceptions:

(900) Non-Freeway Resurfacing, Restoration and Rehabilitation (3R) Improvements

903 – 3R Horizontal Alignment

903.1 – Horizontal Curves

- The existing horizontal curve may be retained if the existing degree of curve provides an actual design speed that is not lower than ten (10) MPH below the legal speed limit for the facility.

903.2 – Superelevation

- Existing superelevation may be retained.

904 – 3R Vertical Alignment

904.2 – Crest Vertical Curves

- The existing crest vertical curve may be retained if the existing crest vertical curve design speed based on minimum sight distance is ten (10) MPH or less below the legal speed limit of the facility.

905 – 3R Cross-Section Elements

905.11 – Lane Width

- The minimum lane width for both curbed and uncurbed pavement shall be ten (10) feet regardless of functional classification. The curbed shoulder (offset) width shall be one (1) foot desirable, zero (0) feet minimum.

905.12 – Shoulder Width

- Minimum graded shoulder width for uncurbed pavements (with or without guardrail) shall be four (4) feet for facilities with an ADT greater than 7,500, and two (2) feet for facilities with an ADT less than 7,500. Minimum

guardrail (face) offset distance shall not be less than the minimum graded shoulder widths noted above.

905.13 – Pavement Cross Slopes

- As stated except that parabolic cross-slopes may be retained if prior history indicates an absence of drainage or accident problems.

906 – 3R Special Considerations

906.1 – Clear Zone

- The clear zone width shall not be less than the minimum graded shoulder widths as stated in *905.12* above for uncurbed pavement.

907 – Pavement Rehabilitation

- Pavement repair/replacement sections shall be constructed as specified by the Designer and approved by the Lake County Engineer.

III. New Construction Projects

The design standards for new construction projects, including pavement replacement projects, shall be as stated in the ODOT L&D Manual, Volume 1, with the following exceptions:

(300) Cross Section Design

301 – Roadway Criteria

301.1.2 – Lane Width

- Lane widths for both curbed and uncurbed roads shall be twelve (12) feet desirable, ten (10) feet minimum on roads with an ADT < 2000 and eleven (11) feet minimum on roads with an ADT > 2000. Curbed shoulder width (offset) shall be two (2) feet desirable, one (1) foot minimum.

301.2.3. – Shoulder Width

- Graded shoulder widths shall be eight (8) feet desirable, three (3) feet minimum with barrier, foreslope 4:1 or flatter.
- Graded shoulder widths shall be ten (10) feet desirable, four (4) feet minimum without barrier, or foreslope steeper than 4:1.
- Minimum treated shoulder width shall be three (3) feet.
- Face of guardrail (where required) shall be placed at the back edge of graded shoulder.

(400) Geometric Design

401 – Intersections at Grade

401.6.1 – Left Turn Lanes

- Condition (A) from Figure 401-9 shall be used to determine storage length. Desirable minimum storage length shall be one hundred (100) feet. Absolute minimum storage length shall be seventy five (75) feet.

(800) Access Control, Right-of-Way Use Permits, and Drive Design

801 – Access Control
802 – Highway Use Permits

- Access control, including the issuance of use permits within a municipality, is under the jurisdiction of the municipality.
- Access control, including the issuance of use permits on county roads within townships, is under the jurisdiction of the Lake County Engineer

803 – Drive Geometric Design
804 – Drive Profile Design

- Drive design within a municipality is under the jurisdiction of the municipality.
- Drive design on county roads within a township is under the jurisdiction of the Lake County Engineer. The information contained in sections 803 and 804 is applicable as a "design guide" only.

***Pavement Design**

Pavement design for Lake County roads shall be determined using The O.D.O.T. Pavement Design and Rehabilitation Manual. Updated traffic counts should be taken on projects involving high truck volumes in order to obtain an accurate B:C ratio for design purposes.

The subgrade California Bearing Ratio (CBR) value shall be determined from soil tests and borings. The average CBR value from the soil analysis shall be used for the pavement design.

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